



**INFORMATION RESOURCE CENTER**

(888) 439-3300 • (518) 439-7612

## **Bibliography #12**

### **Tuberculosis and HIV/AIDS**

**November 2001**

*Books and Journal articles listed herein are available from your local library, medical library, or through inter-library loan. If you have difficulty locating any of the materials listed in this bibliography, please contact the Center at the address below.*

**Policy Research Associates, Inc. • 345 Delaware Avenue, Delmar, New York 12054**

Under contract to the Health Resources and Services Administration, Bureau of Primary Health Care

Badri M, Ehrlich R, Wood R, Pulerwitz T, Maartens G. **Association between tuberculosis and HIV disease progression in a high tuberculosis prevalence area.** *Int J Tuberc Lung Dis* 5(3):225-32, 2001.

SETTING: Adult human immunodeficiency virus (HIV) clinics affiliated to the university of Cape Town, South Africa. OBJECTIVE: To assess the impact of tuberculosis on HIV-1 disease progression in an area with high tuberculosis prevalence and minimal antiretroviral therapy use. DESIGN: Prospective patient cohort study. METHODS: Age, race, risk status, CD4+ T-lymphocyte count, history of AIDS, prophylactic co-dependents Cox proportional hazards regression model. RESULTS: Tuberculosis fulfilling the case definition developed in 158/609 patients in the 5-year observation period. Tuberculosis was associated with as increased risk of AIDS. In a stratified analysis, the increased mortality associated with tuberculosis was observed only in patients with CD4+ T-lymphocyte count > 200 cells/microliter and in those without AIDS at baseline. CONCLUSION: The onset of tuberculosis in HIV-infected patients is associated with an increased risk of AIDS and death. Although a casual link cannot be established in an observational study, our findings support the view that prolonged immune activation induced by tuberculosis leads to prolonged increased HIV replication and consequent accelerated disease progression.

Brewer TF, Heymann SJ, Krumplitsch SM, Wilson ME, Coldits GA, Fineberg HV. **Strategies to decrease tuberculosis in US homeless populations: a computer simulation model.** *JAMA* 286(7):834-42, Aug 2001.

CONTEXT: The rate of TB among US homeless persons may be 20 times that of the general adult population. Studies suggest that the majority of urban homeless TB cases are attributable to ongoing transmission of TB. Optimal TB-control strategies in both chronically and transiently homeless populations are not known. OBJECTIVE: To examine the effects of TB-control strategies on projected TB cases and deaths in US homeless populations using a computer-based simulation model. DESIGN, SETTING, and POPULATION: The US general population and a theoretical population of 2 million homeless individuals in 1995 were divided into 18 clinical states based on the risk for or presence of TB and HIV infection. MAIN OUTCOME MEASURES: Prevalence of transiently and chronically homeless individuals with active TB and deaths from TB as a function of public health measures taken to control and eliminate TB, including improvement of treatment effectiveness, improvement in access to treatment, and vaccination with BCG. RESULTS: A 10% increase in access to treatment among homeless persons with active TB produced larger declines in predicted TB cases and deaths after 10 years (cases and deaths among chronically homeless persons decreased 12.5% and 19.8% and among transiently homeless persons dropped 35.9% and 32.4%, respectively) than improvements in the effectiveness of treatment programs (cases and deaths among chronically homeless persons declined 7.2% and 3.1% and among transiently homeless persons dropped 10.9% and 4.1%, respectively). A 10% increase in access to treatment homeless persons with latent TB infection led to a 6.7% decline in TB among chronically homeless persons and 5.7% decline among transiently homeless persons, while a 10% improvement in effectiveness of treatment for latent TB infection was associated with declines of 3.0% and 3.3%, respectively. When treatment for latent TB infection was modeled to be the same in vaccinated and nonvaccinated population, BCG vaccination led to TB case declines of 15.4% and 21.5% in chronically and transiently homeless populations, respectively. CONCLUSIONS: Overcoming barriers faced by homeless individuals in accessing TB treatment programs will be crucial to reducing the burden of TB in this high risk group. Increased treatment access, improvement in the effectiveness of treatment programs, and BCG vaccination of HIV-negative homeless individuals have the best chance to markedly decrease TB morbidity and mortality.

---

Burman WJ, Jones BE. **Treatment of HIV-related tuberculosis in the era of effective antiretroviral therapy.** Am J Respir Crit Care Med, 164(1):7-12, July 2001.

---

Goedert JJ, Fung MW, Felton S, Battjes RJ, Engels EA. **Cause-specific mortality associated with HIV and HTLV-II infections among injecting drug users in the USA.** AIDS 15(10):1295-302, 2001.

**BACKGROUND:** Human T-lymphotropic virus type II (HTLV-II) is widespread among injecting drug users (IDU) and may contribute to the risk of leukemia/lymphoma, neurodegenerative disease, and perhaps pneumonia, especially with HIV co-infection. **METHODS:** In 1987-1991, 6570 IDUs were tested for HIV and HTLV-II antibodies. In 1998, they were matched to the National Death Index. Numbers of observed deaths of each cause were compared by standardized mortality ratios with the numbers expected, using sex-, race-, age-, and year-specific rates in the general population. Relative risk associated with each virus, compared to uninfected drug users, was estimated. **RESULTS:** There were 1351 deaths, including 683 (15%) of 4604 participants who enrolled seronegative for both viruses; 328 (47%) of 701 who had HIV but not HTLV-II infection; 220 (21%) of 1033 who had HTLV-II but not HIV infection; and 120 (52%) of 232 who were infected by both viruses. Compared to the general population, mortality for participants with neither virus was increased 4.3- fold and was significantly elevated for every cause of death. With HIV, mortality from medical causes, but not external causes, was increased 3.7-fold, particularly with AIDS and related conditions. With HTLV-II, all cause mortality was reduced, but there was no excess mortality from leukemia/lymphoma, other malignancies, or neurodegenerative disease. **CONCLUSIONS:** Without HIV or HTLV-II, IDU had profoundly increased mortality from medical and external causes. HIV was associated with death due to AIDS and related conditions. HTLV-II infection was not significantly associated with mortality from any cause, suggesting that it is not a significant human pathogen, even when present with HIV.

---

Riley ED, Chaisson RE, Robnett TJ, Vertefeuille J, Strathdee SA, Vlahov D. **Use of audio computer-assisted self-interviews to assess tuberculosis-related risk behaviors.** Am J Respir Crit Care Med 164(1):82-5, 2001.

The objective of this study was to compare self-reported TB and HIV risk factors obtained from computer assisted and interviewer-assisted questionnaires among participants of a needle exchange program. Between June 1998 and May 1999, needle exchange program participants requesting TB screening underwent interviews regarding demographics and risk factors for TB and HIV infection. The first 190 participants underwent traditional interviewer-assisted questionnaires, whereas the remaining 92 underwent computer-assisted questionnaires. Among 282 participants, demographic characteristics, health status, HIV serostatus, visits to homeless shelters, alcohol intake, and cigarette smoking were all similar by interview technique. However, respondents receiving computer-assisted questionnaires were more likely than those receiving interviewer-assisted questionnaires to report smoking marijuana, crack, and heroin; as well as sharing cocaine smoking equipment, sharing heroin smoking equipment, "shotgunning," and visiting crack houses. In the final model, respondents receiving computer-assisted questionnaires were more likely to report "shotgunning" and visiting a crack house relative to respondents receiving interviewer-assisted questionnaires. In conclusion, increased odds of high-risk behaviors for tuberculosis and HIV infection among computer-assisted questionnaires to ascertain risk behavior data for both tuberculosis and HIV.

---

Sackoff JE, Torian LV, Frieden TR. **TB prevention in HIV clinics in New York City.** Int J Tuberc Lung Dis 5(2):123-8, 2001.

**SETTING:** Ten hospital-based human immunodeficiency virus (HIV) clinics in New York City. **OBJECTIVE:** To evaluate tuberculosis (TB) prevention in HIV clinics based on the prevalence and incidence of TB and the efficacy of preventative therapy with isoniazid (INH). **DESIGN:** The medical records of 2393 HIV-infected patients with a first clinic visit in 1995 were reviewed retrospectively. Deaths and TB cases through December 1997 were

ascertained through a match the TB and AIDS registries. RESULTS: At first visit, 92 patients (4%) had a history of TB, 98 (4%) were being treated for TB, and six (<1%) were diagnosed with TB. During follow-up, 23 cases were diagnosed, and incidence of 0.53 per 100 person-years (py). Among 439 tuberculin skin test (TST) positive patients, the incidence of TB/100 py was 1.63 in patients with no INH, 1.28 in patients with <12 months of INH, and 1.06 in patients with 12 months of INH. The incidence/100 py was 0.0 in TST-negative patients and 0.37 in anergic patients. The relative risk of TB was 0.65 in TST-positive patients with 12 months of INH (vs. none). CONCLUSIONS: The benefits of TB prevention efforts in these HIV clinics from 1995 to 1997 were limited because most TB occurred before the first clinic visit. Methods for reaching HIV-infected patients earlier should be identified.

## 2000

Murphy D A; Rotheram-Borus M J; Joshi V. **HIV-infected adolescent and adult perceptions of tuberculosis testing, knowledge and medication adherence in the USA.** Aids Care Journal, Vol. 12, No. 1, February 2000, Pages 59-63.

Abstract: HIV-infected adolescent and adult perceptions of tuberculosis (TB) infection rates and physician TB behavior, and patient knowledge of TB transmission and treatment adherence were assessed. HIV-infected youth (n=199) from adolescent clinical care sites in three cities and HIV-infected adults (n=133) in New York were interviewed. Adolescent self-report was compared to medical chart review. Adolescents reported they were significantly less likely to be tested, although testing rates were high for both samples. Approximately 9% of both samples reported infection with TB; the majority of whom reported receiving medication (97%), and consistent medication adherence (93%). The overall mean knowledge score was 66%, with significant age differences: adolescents were less knowledgeable than adults, and young males tended to be less knowledgeable than young females. Age, gender and experience with TB (self-perception of TB, testing history and clinic choice) significantly predicted accuracy of knowledge about TB. Results suggest that if HIV-infected individuals -- a population at very high risk and often among the least able to afford health care resources -- receive the education and support they need from their community health care sources they may substantially reduce their chances of contracting and spreading TB.

## 1999

DeRiemer K, Daley CL, Reingold AL. **Preventing tuberculosis among HIV-infected persons: a survey of physicians' knowledge and practices.** Prev Med 1999 Apr;28(4):437-44

BACKGROUND: Guidelines exist for screening, diagnosing, and preventing tuberculosis (TB) among HIV-infected persons, but their application and utility are unknown. METHODS: We conducted a survey of knowledge and practices among 1,300 physicians in the San Francisco Bay area to assess their practices towards TB among HIV-infected persons. RESULTS: Of 630 respondents, 350 (56%) provided care for HIV-infected persons. Thirty-four percent of the respondents had seen the most recent guidelines for preventing tuberculosis among HIV-infected persons; 65% routinely provide information to HIV-infected patients about the risks of exposure to Mycobacterium tuberculosis; 39% provide annual tuberculin skin testing (TST) to HIV-infected patients without a history of a positive test; 86% knew that  $\geq 5$ -mm induration is considered a positive TST result in HIV-infected

persons; and 47% provide a 12-month regimen of chemoprophylaxis for HIV-infected persons who have a positive TST but not active tuberculosis. Physician specialty and experience with HIV-infected persons were not strongly correlated; experience was a better predictor of correct knowledge and practices. **CONCLUSIONS:** Many physicians were not aware of the standards of care for preventing tuberculosis among HIV-infected patients, even in a geographic area with a high prevalence of M. tuberculosis and HIV. Copyright 1999 American Health Foundation and Academic Press.

---

Dievler A, Pappas G. **Implications of social class and race for urban public health policy making: a case study of HIV/AIDS and TB policy in Washington, DC.** Soc Sci Med, 48(8):1095-102, April 1999.

This paper explores how social class and race affect the public health policy-making process in an urban area. Ethnographic methods were used to collect and analyze information about HIV/AIDS and tuberculosis policy-making by the Washington, DC Commission of Public Health. Kingdon's conceptual model of policy making was used to analyze and understand the process. The problems of HIV/AIDS and tuberculosis in the district have important social class dimensions that were not always made explicit, but were instead defined in terms of 'race' and 'place'. Social class considerations and racial politics shaped what policies were developed or not developed and implemented successfully or failed. This study, which has national and international implications, concludes that there is a need to improve our understanding of the complex social dimensions of public health problems; there needs to be more consideration of the politics of strategy formulation and how issues of social class and race affect this process; and public health needs to strengthen its constituency in order to build support for the successful development and implementation of policy.

---

Mehta JB, Roy TM, Hughes SK, Byrd RP Jr, Harvill LM. **Demographic changes in tuberculosis: high risk groups.** South Med J, 92(3):280-4, March 1999.

We conducted a statistical analysis of all verifiable tuberculosis (TB) cases in Tennessee from 1990 through 1996 to determine the demographic changes in TB. We studied variables, including age, sex, race, site of the disease, and possible impact of known risk factors such as human immunodeficiency virus (HIV) infection, homelessness, foreign birth, and residency in extended care facility. The percentage increase in all such categories, except in the nursing home population, had a statistically significant increase. Unlike national epidemiologic findings, foreign-born TB comprised less than 1% of the total cases. Association of HIV as a co-infection increased from 16 (2.7%) in 1990 to 41 (8.1%) in 1996. These findings will have significant impact on TB control measures and the clinical practice of TB cases in Tennessee and other areas of the southeastern US.

---

Schluger NW. **Issues in the treatment of active tuberculosis in human immunodeficiency virus-infected patients.** Clin Infect Dis 1999 Jan;28(1):130-5

Most HIV-infected patients with TB can be treated satisfactorily with standard regimens with expectations of good results. Treatment of TB in these patients has been complicated by the introduction of HAART, which relies on drugs that interfere with the most potent class of antituberculous medications. Rifampin-free regimens or regimens that employ rifabutin may be acceptable strategies for patients who are receiving protease inhibitors, although these regimens have not been rigorously evaluated in patients with AIDS. At present, there is good reason to believe that a 6-month course of a rifabutin-containing regimen or a 9-12-month course of a regimen of streptomycin, isoniazid, and pyrazinamide should be adequate therapy for most patients with drug-susceptible disease. As the treatment of HIV infection with antiretroviral agents evolves, the treatment of TB in patients with AIDS is likely to evolve as well. This will require careful coordination of antituberculosis and antiretroviral therapies.

---

Telzak EE, Chirgwin KD, Nelson ET, Matts JP, Sepkowitz KA, Benson CA, Perlman DC, El-Sadr WM. **Predictors for multidrug-resistant tuberculosis among HIV-infected patients and response to specific drug regimens. Terry Beirn Community Programs for Clinical Research on AIDS (CPCRA) and the AIDS Clinical Trials Group (ACTG), National Institutes for Health.** Int J Tuberc Lung Dis 1999 Apr;3(4):337-43

SETTING: Mortality associated with human immunodeficiency virus (HIV) related multidrug-resistant tuberculosis (MDR-TB) is reduced with effective early therapy. Identifying predictors of, and effective regimens for, MDR-TB is critical. OBJECTIVE: A multicenter prospective study was initiated to 1) determine the demographic, behavioral, clinical and geographic risk factors associated with the occurrence of MDR-TB among HIV-infected patients, and 2) to evaluate the overall survival and clinical response of MDR-TB patients treated with specific drug regimens. METHODS: Patients were prospectively evaluated for MDR-TB. Information included history of prior treatment for tuberculosis, close contact with a known case of MDR-TB, and residence in a facility with known or suspected MDR-TB transmission. Patients with known MDR-TB, or those suspected to be at high risk, were offered enrollment in a treatment pilot study. Study drugs included levofloxacin and at least two additional drugs to which the patient's isolate was known, or most likely, to be susceptible. Survival was the primary endpoint. RESULTS: Complete data are available for 156 HIV-infected patients with confirmed tuberculosis. Sixteen (10%) had MDR-TB. Only a history of prior tuberculosis treatment was associated with MDR-TB in multivariate analysis. Twelve patients with MDR-TB enrolled in the treatment pilot had a median CD4 cell count of 51/mm<sup>3</sup>. The cumulative probability of survival at one year was 75% and at 18 months, 65.6%. Toxicity requiring discontinuation of medications occurred in two patients. CONCLUSIONS: A history of treatment for tuberculosis was the only predictor for MDR-TB in a cohort of HIV-infected patients with tuberculosis. In addition, this prospective study supports the results of prior retrospective studies that effective treatment impacts on mortality. Current second-line treatment, including high dose levofloxacin, appears to be reasonably well tolerated.

---

Weis, S.E.; Foresman, B.; Cook, P.; Matty, K. **Universal HIV Screening at a Major Metropolitan TB Clinic: HIV Prevalence and High-Risk Behaviors Among TB Patients.** American Journal of Public Health, 89(1): 73-75, January 1999.

OBJECTIVES: This study assessed the outcome of implementing a policy of universal screening of patients with TB for HIV infection at a major metropolitan public health TB clinic. METHODS: HIV serologic testing was completed on 768 (93%) of 825 eligible patients. Ninety-eight HIV-positive cases (13%) were compared with 670 HIV-negative cases. The presence of adult HIV risk factors was determined by structured interview and review of medical records. RESULTS: One or more HIV risk factors were present in 93% of HIV-positive and 42% of HIV-negative cases. CONCLUSIONS: the metropolitan TB clinic is well suited for HIV screening, and HIV-antibody testing and counseling should be provided to all TB patients.

---

Wroten JE, Crockett LK, Kertesz C. **Trial marriage: Florida's experience in consolidating HIV/AIDS, STD, and TB programs.** Public Health Rep, 114(1):74-80, Jan-Feb, 1999.

After a three-year experiment in consolidating services, the Florida Dept. of Health has again separated programs for the prevention and control of HIV/AIDS, sexually transmitted diseases (STDs), and TB. The authors report that while there were some clear advantages to consolidating services, especially programs dealing with HIV and other STDs, the individual programs suffered in some important ways. The authors describe Florida's effort to preserve the positive programmatic and administrative aspects of the consolidated approach and to apply the lessons learned.

## 1998

Centers for Disease Control and Prevention. **Prevention and Treatment of Tuberculosis Among Patients Infected with Human Immunodeficiency Virus: Principles of Therapy and Revised Recommendations.** MMWR 47(RR\_20), October 30, 1998.

These guidelines update previous CDC recommendations for the diagnosis, treatment, and prevention of TB among adults and children co-infected with HIV in the U.S. The most notable changes in these guidelines reflect both the findings of clinical trials that evaluated new drug regimens for treating and preventing TB among HIV-infected persons and recent advances in the use of antiretroviral therapy. AVAILABLE FROM: CDC National Prevention Information Network, PO Box 6003, Rockville, MD 20850. (800) 458-5231.

---

Glynn JR. **Resurgence of tuberculosis and the impact of HIV infection.** Br Med Bull, 54(3):579-93, 1998.

Tuberculosis is increasing in many countries. In some areas the major influences on tuberculosis trends are the traditional ones: poverty, failures in the treatment system, and immigration. In others, and increasingly, the HIV epidemic is having a huge impact. HIV infection increases the risk of TB approximately 7-fold, though this may vary with the stage of the HIV epidemic, the prevalence of TB, and the age groups considered. Dually-infected individuals develop TB disease at a rate of 5-10% per year. HIV also increases the risk of disease following recent infection, which makes a major contribution to the TB burden in some settings. HIV-infected individuals, may transmit Mycobacterium TB less than do HIV-negative individuals, but the extra cases will add to the transmission overall, and evidence of HIV-attributable increases in the annual risk of infection is beginning to be seen.

---

Messmer PR; Jones S; Moore J; Taggart B; Parchment Y; Holloman F; Quintero LM. **Knowledge, perceptions, and practice of nurses toward HIV+/AIDS patients diagnosed with tuberculosis.** J Contin Educ Nurs, 29(3):117-125, May 1998.

BACKGROUND: Tuberculosis (TB) continues to be a major health problem in the United States. Nurses may be exposed to TB and not realize their risks for becoming infected. The presentation of HIV-associated TB is somewhat different from "standard TB." PURPOSE: The purpose of this study was to determine if an educational program could improve nurses' attitudes, level of knowledge, and compliance with infection control standards for HIV/AIDS patients diagnosed with TB. METHOD: Participants included 50 staff nurses. The experimental group (35) and control group (15) completed a knowledge test and an attitude survey. Researchers observed participants for compliance with infection control standards pretest and posttest. RESULTS: Following an educational program, the experimental group demonstrated a greater knowledge of TB than the control group who did not participate in the educational program. In addition, the experimental group had a greater improvement in their Nursing precaution protocols scores as compared to the control group. However, there was not a tangible increase in knowledge level of AIDS, attitudes or concerns about caring for these patients. CONCLUSION: This nursing research study supports the need for an ongoing educational program with continual monitoring of infection control practices to positively affect client and caregiver outcomes.

## 1997

Alpert PL; Munsiff SS; Gourevitch MN; Greenberg B; Klein RS. **A prospective study of tuberculosis and human immunodeficiency virus infection: clinical manifestations and factors associated with survival.** Clin Infect Dis, 24(4):661-8, April 1997.

We prospectively studied the effect of human immunodeficiency virus (HIV) infection on the presentation and outcome of tuberculosis. A total of 216 patients with tuberculosis were identified; 162 (75%) of these patients were tested for antibodies to HIV; 92 (57%) were seropositive. The patients who were seropositive for HIV were more likely to be male and Hispanic and to have been homeless or incarcerated. Eighty-one percent of these patients had CD4 lymphocyte counts of  $< \text{or } = 200/\text{mm}^3$ . The seropositive patients had extrapulmonary tuberculosis more often than did the seronegative patients. Smears for acid-fast bacilli were positive more often for non-HIV-infected patients with pulmonary tuberculosis (74.5%) than for HIV-infected patients (54.3%) -even those with focal or cavitary disease. A delay in initiating therapy was associated with in-hospital mortality: The median time from admission to the start of treatment was 4 days for patients who survived and 15 days for those who died. The median survival was 22.7 months for HIV-infected patients who did not die during the initial hospitalization. Factors independently associated with reduced rates of survival included the severity of immunodeficiency, nonuse of directly observed therapy, infection due to drug-resistant *Mycobacterium tuberculosis*, and a history of injection drug use.

---

Farmer P. **Social scientists and the new tuberculosis.** Soc Sci Med, 44(3):347-358, February 1997. Comment in: Soc Sci Med, 45(10):1597-9, November 1997.

In much of the world, tuberculosis (TB) remains the leading killer of young adults, in spite of the fact that effective chemotherapy has existed for 50 years. The epidemiology of TB, with its persistence in poor countries and resurgence among the poor of many industrialized nations, causes consternation among those charged with protecting the public's health. Two factors, ostensibly biological in nature, are commonly cited to explain this setback: the advent of HIV and the emergence of TB strains resistant to multiple drugs (MDR TB). But the strikingly patterned occurrence of MDR TB-in the United States afflicting those in homeless shelters and in the inner city, for example-speaks to some of the large-scale social forces at work in the new epidemic, which began before the advent of HIV. These forces (which include poverty, economic inequality, political violence, and racism) are examined through the experience of a young Haitian man with MDR TB, a disease never before described in Haiti. Insights from this case, and from other research on TB and HIV disease, are considered in the light of past anthropological writings on TB. It is argued that, often, social scientists mar contributions to an understanding of TB by making "immodest claims of causality" regarding its distribution and course. Alternative strategies for future sociomedical research on MDR TB are proposed.

---

Lienhardt C; Rodrigues LC. **Estimation of the impact of the human immunodeficiency virus infection on tuberculosis: tuberculosis risks re-visited?** Int J Tuberc Lung Dis, 1(3):196-204, June 1997.

The human immunodeficiency virus (HIV) infection has both a direct and an indirect effect on the incidence of tuberculosis. The direct effect is due to the increased number of cases among HIV-infected individuals because of their enhanced susceptibility to the disease. The indirect effect is increased transmission of *Mycobacterium tuberculosis* infection in a community with high levels of dual infection, as a consequence of infectious cases occurring in HIV-infected persons. The risk of infection by *M. tuberculosis* in the population will then increase, as



will the number of tuberculosis cases in the general population. According to the World Health Organization, over 4 million people are estimated to be dually infected with HIV and *M. tuberculosis* world-wide. In 1990, it was estimated that 300,000 new TB cases (4% of total new cases) were attributable to HIV infection; around 1.4 million cases are expected per year by 2000 (equivalent to about 14% of expected cases), thus increasing the reservoir of tuberculosis patients capable of transmitting the infection to others, and increasing the burden on the already overstretched National Tuberculosis Control Programs, especially in resource-poor countries. This paper is a review of methods suggested to quantify the effect of the interaction between HIV infection and tuberculosis at population level, and more particularly the effect of HIV on the risk of tuberculosis infection.

---

Morrow R; Fanta J; Kerlen S. **Tuberculosis screening and anergy in a homeless population.** J Am Board Fam Pract, 10(1):1-5, January 1997.

**BACKGROUND:** Tuberculosis has again emerged as a growing public health concern in the United States. Among the homeless population, increased risk factors contribute to immunodeficiency, which can cause false-negative results on purified protein derivative (tuberculin) (PPD) skin testing, the standard screening procedure for tuberculosis in individuals. We evaluated the accuracy of PPD skin test results by determining anergy status of patients when offering the PPD test. **METHODS:** A consecutive convenience sample of 105 underserved men and women were tested at a health clinic located in a homeless shelter in Yonkers, NY. These persons were currently homeless, living in a shelter, or formerly homeless and using the soup kitchen at the shelter. Three antigens, candidin, mumps, and trichophyton, in addition to PPD, were administered intradermally using the Mantoux method, and results were read 48 to 72 hours later on the 100 (95%) who returned. An individual was considered to be anergic if the delayed-type hypersensitivity reactions were less than or equal to 2 mm for each of the four antigens. **RESULTS:** Of the 100 persons who returned for follow-up, 5 (5%) were found to be anergic. Of these 5, all were previously known to be positive for human immunodeficiency virus (HIV). **CONCLUSIONS:** PPD testing alone was found to be an accurate screening test in this population except in those who were HIV positive.

## 1996

Frieden TR; Woodley CL; Crawford JT; Lew D; Dooley SM. **The molecular epidemiology of tuberculosis in New York City: the importance of nosocomial transmission and laboratory error.** Tuber Lung Dis, 77(5):407-413, October 1996.

**SETTING:** During the 1980s, New York City (NYC) experienced a rapid increase of TB cases, more than 40% of which were HIV-associated. **OBJECTIVE:** To better define the molecular epidemiology of tuberculosis in NYC. **DESIGN:** We collected an isolate from every patient in NYC with a positive culture for *Mycobacterium tuberculosis*, including both incident and prevalent cases, in April 1991. Restriction fragment length polymorphism (RFLP) analysis using IS6110 was performed and the clinical, demographic, epidemiologic, and drug susceptibility patterns of patients were correlated with RFLP results. **RESULTS:** Of 441 patients, 12 (3%) had laboratory, clinical, and RFLP evidence of falsely positive cultures. The remaining 429 patients had 252 distinct RFLP patterns. Patients with clustered 1-3 band isolates did not share demographic or drug susceptibility patterns. Eliminating these patients from the analysis, 344 patients remained, of whom 126 (37%) belonged to one of 31 clusters ranging in size from 2-17 patients (median cluster size = 3). Clustering was more common among patients with multidrug-resistant isolates (53%), African Americans (44%), and the homeless (49%), but was not associated with HIV/AIDS. Multidrug-resistance, being African American, and homelessness remained independently associated with clustering. Of 79 patients in clusters of  $\geq 4$  patients, 25 (32%) had identifiable epidemiologic linkages; 17 (74%) of these

patients, and 6% of all cases, were documented to have been nosocomially associated. **CONCLUSION:** A small but non-negligible proportion (3%) of NYC patients had falsely positive cultures for *M. tuberculosis* as a result of laboratory error. More than one third of all patients and most patients with multidrug-resistance in April 1991 had clustered RFLP patterns, suggesting recent transmission of *M. tuberculosis*. Homelessness, multidrug-resistance, and being African American independently increased the risk of clustering. Most of the identified epidemiologic linkages and 6% of all cases resulted from transmission in hospitals.

---

Hoffman, N.; Kelly, C.; and Futterman, D. **Tuberculosis Infection in Human Immunodeficiency Virus-Positive Adolescents and Young Adults: A New York City Cohort.** *Pediatrics*, 97(2): February 1996.

**OBJECTIVES:** Adolescents with HIV infection are at increase risk for TB, underscoring the importance of early identification of TB infection. The goals of this study were to assess the factors associated with the completion of evaluations for TB in a cohort of HIV-positive adolescents and young adults and to describe the prevalence of *M. tuberculosis* infection and adherence to antituberculous treatment regimens. **METHODS:** A retrospective chart review was done for all HIV-positive adolescents and young adults, ages 13 to 21 years (n=49), seen in a comprehensive care program from January 1991 through December 1992. Data collected included CD4 cell count, HIV clinical status, living situation, substance use history, and the completion of an annual evaluation for TB infection. **RESULTS:** Thirty-one (63%) of 49 patients completed evaluations for TB. Of the 31 completed evaluations, 18 were assessed by clinic staff on site, and 13 were assessed by other medical or trained nonmedical observers through community networking efforts. Neither homelessness nor illicit substance use were factors in the completion of the evaluation. Six (19%) of the 31 patients had positive PPD skin test results. Three had medical histories and chest radiographs suggesting active TB, and all were hospitalized for at least two weeks. Two had positive cultures for *M. tuberculosis*, although the third also responded clinically to antituberculous therapy. All three were otherwise asymptomatic for HIV infection, with only moderately depressed CD4 cell counts. All three were homeless and used crack cocaine. After the initial treatment as inpatients, none completed treatment within the prescribed time period. **CONCLUSIONS:** The completions of the evaluations for TB were greatly facilitated by community networking, but innovative strategies to enhance both screening and treatment programs, such as training youth service providers in the community to read PPD skin tests, expansion of directly observed therapy services, and youth-centered programs for housing and substance use, need further development. The high prevalence of TB in the cohort underscores the need for providers to increase efforts to identify cases of TB infection among adolescents and young adults and to incorporate HIV risk assessment, counseling, and testing into their practices routinely.

---

Rubinstien EM; Madden GM; Lyons RW. **Active tuberculosis in HIV-infected injecting drug users from a low-rate tuberculosis area.** *J Acquir Immune Defic Syndr Hum Retrovirol*, 11(5):448-454, April 15, 1996.

This article describes the features of active tuberculosis in HIV-infected injecting drug users (IDUs) from a low-rate tuberculosis area. The cohort was followed in a hospital-based HIV/AIDS registry, and data were extracted from the registry, patient charts, and the Tuberculosis Control Program of the Connecticut Health Department. The setting was an acute care inner-city hospital-based health care system, with a high incidence of AIDS, serving a small-to-medium urban area in Connecticut. The patients were 905 HIV-infected IDUs whose time of HIV diagnosis (TOHD) was between 1984 and 1992. The outcome measures were demographics, clinical characteristics, and morbidity rates of active tuberculosis. Of the 27 IDUs who developed active tuberculosis, none were white, all but one were male, and only one was known to have had a positive purified protein derivative (PPD) reaction prior to

TOHD: 59% of cases developed in patients known to be HIV infected, 11% occurred in established AIDS patients, and 67% qualified as extrapulmonary tuberculosis (that is, AIDS defining by pre-1993 definitions). In 22% of cases, both *Mycobacterium tuberculosis* and *M. avium-intracellulare* were isolated. *Mycobacterium tuberculosis* was most commonly isolated from a respiratory specimen (67%). The annual incidence rate has been  $\leq 1.0\%$  since 1988. The cumulative incidence rate was highest for patients with a positive PPD reaction or a history of tuberculosis (1.4 cases/100 patient years; 52 patients; mean follow-up 4.0 years). The demographics and clinical characteristics of active tuberculosis in our HIV-infected IDUs are similar to those described elsewhere in the United States; the morbidity rates are low and stable. The implications of our findings on tuberculosis control in HIV-infected IDUs may be applicable to health care systems with low tuberculosis rates.

---

Saez H; Valencia E; Conover S; Susser E. **Tuberculosis and HIV among mentally ill men in a New York City shelter.** American Journal of Public Health, 86(9):1318- 1319, 1996.

The current spread of TB in New York City has been linked to both the HIV epidemic and homelessness. Recent reports indicate that homeless individuals who have mental illness, particularly men, are at high risk for HIV. This article describes the results of a study conducted at a shelter that accommodated between 600 and 1000 men. Results show there was a high prevalence of TB among these men (36.7%). Various statistics are included.

---

Townsend MH; Stock MS; Morse EV; Simon PM. **HIV, TB, and mental illness in a health clinic for the homeless.** J La State Med Soc, 148:267-70, June 1996.

Medical records of both mentally ill and non-mentally ill patients were reviewed in a homeless clinic in New Orleans. The records of all psychiatric patients (n=52) and a randomly selected comparison group (n=236) of clinic patients without mental illness were reviewed. Five of the 52 homeless mentally ill who were tested for HIV had a positive test (9.6%), as did seven of the 129 homeless people without mental illness (5.4%). Only five of the 29 mentally ill tested for TB were PPD positive (17.2%), as compared to 34 (29.3%) of the non-mentally ill, a strong trend. Differing trends were found regarding HIV and TB in the two groups under study. Further work with a larger sample is needed to determine the factors, if any, which facilitate the spread of HIV and inhibit that of TB.

## 1995

Brickner PW; McAdam JM. **Tuberculosis, HIV disease, and directly observed therapy.** J Public Health Manag Pract, 1(4):52-4, Fall 1995.

Directly observed therapy (DOT) to enable completion of antituberculous therapy works. DOT is largely responsible for the recent improvement in tuberculosis case rates in New York City. Despite this favorable trend, the factors of significant HIV disease rates and of multidrug resistant forms of tuberculosis bacteria in the population are of grave concern. Therefore, in addition to DOT other means of preventing tuberculosis spread should be encouraged. These

include directly observed preventive therapy (DOPT) programs, use of masks, improved ventilation in crowded settings such as homeless shelters, and ultraviolet light germicidal irradiation of upper room air in such locations.

---

Layton MC; Cantwell MF; Dorsinville GJ; Valway SE; Onorato IM; Frieden TR. **Tuberculosis screening among homeless persons with AIDS living in single-room-occupancy hotels.** Am J Public Health, 85:1556-9, November 1995.

Congregate facilities for homeless persons with AIDS are often endemic for TB. We evaluated TB screening methods at single-room-occupancy hotels housing persons with AIDS. Residents were screened by cross matching the New York City Tuberculosis Registry, interviewing for TB history, skin testing, and chest radiography. Cases were classified as either previously or newly diagnosed. Among the 106 participants, 16 (15%) previously diagnosed TB cases were identified. Participants' TB histories were identified by the questionnaire (100%) or by registry match (69%). Eight participants (50%) were noncompliant with therapy. These findings prompted the establishment of a directly observed therapy program on site.

---

McGowan JE Jr; Blumberg HM. **Inner-city tuberculosis in the USA.** J Hosp Infect, 30 Suppl:282-295, June 1995.

Tuberculosis (TB) has become more common during the past five years in several areas of the USA. Occurrence has been facilitated by the increasing number of patients with concurrent HIV infection, by cases due to multiple-drug-resistant strains, by incomplete TB therapy among homeless and non-compliant patients, and by cases in immigrants from other countries where TB prevalence is high. These features mean that the major burden of TB today is being borne by inner-city health care facilities that care for the poor. This is illustrated by data from Atlanta, Georgia, where a large proportion of the new cases in the metropolitan area are reported by Grady Memorial Hospital, the public hospital serving the indigent and working poor of the inner city. Similar patterns are recognized in the other USA cities where TB has again become a blight. In view of these epidemiological features, minimizing inner-city TB will require careful attention to diagnosis and isolation procedures in the hospital. Engineering changes at hospitals providing acute care of TB have recently been ordered by the federal government. These promise to be very expensive, and primarily affect the public hospitals, which can least afford them. Innovative treatment programs are essential, as follow-up after acute care is difficult in this setting. Directly observed therapy can help, but for some cases the era of the TB hospital may have returned. Current attention focuses on legal and ethical issues associated with detaining non-compliant and recalcitrant patients to complete their therapy. Bacille Calmette Guerin (BCG) vaccine is not a priority for this setting at this time.

---

Sackoff J; Lawton K; Torian L; Frieden T; Chiasson M; Singh T; Weisfuse I. **Characteristics of women with TB and AIDS in New York City.** HIV Infect Women Conf, :P91, February 22-24, 1995.

Objective: To describe the sociodemographic and clinical characteristics of women who have TB and AIDS in New York City. Methods: From the New York City AIDS Surveillance System we randomly selected 1,020 patients with a first episode of TB after 1990. This report is restricted to 188 cases collected thus far from eight of the hospitals with the largest TB caseloads. Data were abstracted from medical records and the New York City Dept. of Health TB Registry. Results: Women comprised 22% of the sample. At the time of the TB evaluation, their mean age was 36 years (vs 39 in men). 66% of the women were African American, 27% Hispanic and 7% white, similar to the men. Twice as many women as men were homeless when evaluated for their TB (26% vs. 13%). Women and men did not differ in history of injection drug use (55% vs 58%), but more women reported noninjection cocaine use (48% vs 30%). Women and men were similar in terms of site of TB (84% vs. 82% pulmonary), resistance to 1 TB drugs (34% both), and TB as the first AIDS defining illness (75% vs 73%). Only 7% of the women (vs 18% men) presented with a concurrent AIDS defining illness. Based on life table estimates, at three months from TB diagnosis,

14% of women and 16% of men had died; at two years, mortality was 28% and 52% respectively. Conclusion: Women with TB and AIDS in this sample differed from men on some social factors. Their two-year survival was significantly better and further investigation is needed to understand why.

---

**State TB and AIDS officials knock down barriers.** AIDS Alert, 10:88-91, July 1995.

Officials at the Centers for Disease Control and Prevention (CDC) are using Connecticut as a model for how AIDS and tuberculosis (TB) control programs share information. The two registries have been sharing information since 1986 and find that the match helps both programs monitor recent infection trends and target screening efforts. The law in Connecticut assures that providers will report the HIV status of TB patients and increase the chances that the patients receive proper treatment. By making latent TB a reportable condition in HIV-positive patients, officials also are able to offer preventive therapy and directly observed therapy (DOT) to patients who otherwise may develop active TB. Many civil rights groups have opposed sharing HIV or AIDS reporting with other health agencies because of potential breaches in confidentiality. Although the public health need for identifying co-infection cases is easily justified, confidentiality issues are politically sensitive. In urging TB and AIDS programs to create methods for facilitating detection of co-infection cases, the CDC used a co-infection survey of Chicago. Chicago has a confidentiality law prohibiting the direct reporting of co-infected people to the TB control program. However, the city health department has recently required cases to be reported to both the TB and AIDS registries, facilitating investigation and preventive therapy to contacts.

## 1994

Colson P; Susser E; Valencia E. **HIV and TB among people who are homeless and mentally ill.** Psychosocial Rehabilitation Journal, 17: 157-160, April 1994.

Homeless mentally ill residents of municipal shelters in New York City (NYC) are at particular risk for TB and HIV infection. The large number of active TB cases seen among homeless populations may be due to the confluence of higher than normal TB infection rates and weakened immune systems due to HIV. Other contributing factors include: (1) NYC is an epicenter of TB infection; (2) shelters have overcrowded, unsanitary conditions, as well as poor ventilation; and (3) many shelter residents have been incarcerated in NYC jails, another amplification point. This article looks at the Critical Time Intervention (CTI) Program at the Fort Washington Men's Shelter in NYC. The authors conclude that homeless mentally ill persons who are HIV positive and exposed to TB in shelters would benefit from prophylactic treatment to avoid developing active TB disease.

---

Macher A; Jones M; Webb V; Mann M; Palmer J; Goosby E. **Tuberculosis in Alaskan Native women with HIV disease: the first cases.** Int Conf AIDS 10:173 (abstract no. PB0707), 1994.

ISSUE: Through June 30, 1993, 69 Alaskan Natives had tested seropositive for HIV. Through 23 October 1993, 42 cases of TB were reported in Alaska; among these, 30 were Alaskan Natives. We report the clinical presentations and complications of the first Alaskan Natives to present with concomitant HIV disease and pulmonary TB. CASES: The first patient, with a CD4+ lymphocyte (CD4) count of 30/mm<sup>3</sup>, was admitted from a nursing home where she had a one month history of fever, cough and 12 pound weight loss. The second patient had been homeless, and presented with a CD4 count of 810/mm<sup>3</sup> and a four month history of night sweats, cough and pleuritic chest pain. The clinical courses of these patients were complicated by a number of factors including abuse of cocaine and

alcohol, an atypical roentgenographic pulmonary presentation, false negative PPD skin tests, false negative direct acid-fast smears, reliance upon a single negative acid-fast smear of concentrated sputum to rule out TB, and patient non-compliance. **CONCLUSIONS:** Historically, Alaska's native population has been disproportionately overrepresented by active cases of TB. As HIV infection surreptitiously spreads among the state's natives, additional patients will present with concomitant HIV disease and TB. Homelessness and polysubstance abuse will further complicate this multifactorial and multidimensional dilemma.

---

Osman H. **Tuberculosis in AIDS patients: an ethical dilemma for discharge planning.** Disch Plann Update 14:1, 3-7, 1994.

Discharge planning with AIDS patients has become more complex since the resurgence of tuberculosis in this group. Such psychosocial problems as drug use, homelessness, and poverty have also contributed to the difficulty in discharge planning because of issues of noncompliance with medical regimens and the subsequent development of drug-resistant strains of TB. Ethical conflicts, resulting from balancing respect for patient autonomy with the obligation to cause no harm to society, arise for the health care professional who coordinates the discharge plan. Every effort to decrease the incidence of rehospitalization, especially through the emergency department, should be taken to control the cost of inpatient care. These efforts should focus on arranging for directly observed therapy and placing the homeless in shelters that promote outpatient treatment.

---

Salomon N; Perlman DC; DePalo VA; Kolokathis A; Wilets I. **Drug-resistant tuberculosis: factors associated with rise in resistance in an HIV-infected urban population.** Mt Sinai J Med 61:341-8, 1994.

Our objective was to characterize the population with TB and to identify factors predictive of resistance to anti-TB agents in an area of high prevalence of HIV infection. We reviewed microbiology and clinical records from 1988 to 1991 at Beth Israel Medical Center, New York City, for patients with culture-proved TB and analyzed the frequency of resistance to anti-TB agents with respect to demographic and clinical variables. Of 360 patients with TB, 17.5% had drug-resistant isolates. Of the 333 patients on whom the information was available, 72% reported HIV risk factors, 54% injectable drug use, and nearly one-third homelessness. The majority (56%) had documented HIV infection. Between 1988 and 1991, acquired resistance to isoniazid (INH) alone rose from 5% to 21% and initial resistance to INH alone rose from 0% to 19%. Drug resistance was more likely in previously treated patients; 61% of the previously treated patients admitted noncompliance with therapy. Cavitary lung disease was the strongest predictor of acquired drug resistance. Initial drug resistance was more likely in patients with HIV infection. Among persons with HIV infection, none of the analyzed factors was found to be predictive of drug resistance. Noncompliance with therapy and the HIV epidemic play a major role in the rise of drug resistance. HIV infection confounds the epidemiologic factors that might otherwise allow clinical prediction of resistance.

---

Zolopa AR; Hahn JA; Gorter R; Miranda J; Wlodarczyk D; Peterson J; Pilote L; Moss AR. **HIV and tuberculosis infection in San Francisco's homeless adults: prevalence and risk factors in a representative sample.** [see comments] JAMA 272:455-61, 1994.

**OBJECTIVE:** To determine the prevalence and risk factors for human immunodeficiency virus (HIV) and tuberculosis (TB) infection and investigate the relationship between these two infections in homeless adults. **DESIGN:** Cross-sectional study. **SETTING:** Inner-city shelters and free meal programs. **PARTICIPANTS:** A representative sample of 1226 adults ( $\geq 18$  years) were enrolled from community sites. **MAIN OUTCOME MEASURES:** Serum HIV-1 antibody status and tuberculin skin test reactivity. **RESULTS:** Human immunodeficiency virus seroprevalence was 8.5% and the prevalence of TB infection was 32%. Nineteen percent of the HIV-seropositive subjects had positive tuberculin skin tests. Independent risk factors for HIV infection included

younger age, black race, male homosexual contact, injection drug use, use of injection drugs in shooting galleries, and selling sex. Tuberculosis infection was associated with the duration of homelessness and living in crowded shelters or single-room-occupancy hotels. Injection drug use, a risk factor for HIV, was also a risk factor for TB, with a particularly strong association in women. No evidence of an association between TB and HIV infection was found, even after accounting for anergy. **CONCLUSIONS:** The homeless population in the United States should be considered a group at high risk for HIV infection and TB. Given the constellation of risk factors present, the high prevalence of infection, and lack of access to medical services, we anticipate that these communicable diseases in this population will represent a growing public health problem.

## 1993

Bakshi SS; Alvarez D; Hilfer CL; Sordillo EM; Grover R; Kairam R. **Tuberculosis in human immunodeficiency virus-infected children. A family infection.** Am J Dis Child, 147(3):320-4, March 1993.

**OBJECTIVE:** To study the epidemiologic and clinical features of infection with Mycobacterium tuberculosis in human immunodeficiency virus (HIV)-infected children and their families. **PATIENTS AND CLINICAL SETTING:** Sixty families of children with HIV infection, children of HIV indeterminate status, and seroreverters underwent follow-up in a comprehensive multidisciplinary program for children and families. **METHODS:** Infection with M tuberculosis was diagnosed based on a positive Mantoux test result or a positive culture. **RESULTS:** Mycobacterium tuberculosis infection was diagnosed in seven children (three infected with HIV, three seroreverters, and one uninfected sibling of an infected child) from four families (6%). All infections were detected in the period from March 1990 through January 1992. Six of seven children had a history of exposure to M tuberculosis in an HIV-infected adult (parent) who was an intravenous drug user, homeless, and/or noncompliant with the medical regimen. All HIV-infected children and one seroreverter had pulmonary tuberculosis. One child died of complications of tuberculosis and HIV infection. The M tuberculosis isolated from this child was resistant to isoniazid, rifampin, and streptomycin sulfate. **CONCLUSIONS:** Tuberculosis is a growing problem among inner-city children born to HIV-infected parents. Children infected with HIV in this study had symptomatic and severe disease with tuberculosis, which reflected the drug susceptibility pattern of M tuberculosis seen in our community.

---

Bayer R; Dubler NN; Landesman S. **The dual epidemics of tuberculosis and AIDS: ethical and policy issues in screening and treatment.** Am J Public Health, 83(5):649-54, May 1993.

As the recent increase in cases of tuberculosis is addressed, there is a danger that the need for increased protection of the public health will create a climate in which the rights of individuals with tuberculosis and human immunodeficiency virus (HIV) infection may be disregarded. This paper considers ethical and policy issues in the control of tuberculosis. The authors conclude that mandatory HIV testing is not critical to effective tuberculosis control, and that although individuals infected with HIV are at increased risk for developing tuberculosis, exclusionary employment practices are not justified. Because failure to complete the course of tuberculosis treatment increases the prospect that drug-resistant strains will develop, it is crucial to require all those who commence treatment to complete their therapy. To ensure the completion of treatment, special attention must be paid to the needs of the homeless, drug users, and those with psychiatric impairments. In addition, all tuberculosis patients should begin their posthospital care under direct observation. Patients who fail to complete treatment despite efforts to encourage and facilitate their cooperation should be subject to confinement after a hearing with full due process protections.

---

Dobkin J; Bangsberg D; Brudney K; Kalkut G; Bloom B; Alland D. **Detection by DNA fingerprinting (DNA FP) of a >hidden= tuberculosis outbreak among HIV+, homeless patients.** Int Conf AIDS 9:324 (abstract no. PO-B07-1135), 1993.

The recent increase in TB in New York City has been mostly attributed to HIV-induced TB reactivation. Outbreaks of multidrug-resistant (MDR) TB in hospitals and prisons and soaring rates of pediatric TB indicate substantial ongoing transmission. For most TB cases it has been impossible to distinguish reactivation from recent infection. DNA FP now makes this possible. We evaluated 56 TB cases seen in 1990 at a large medical center which has had neither a known TB outbreak nor a high rate of MDR TB. There were three sets of two identical strains including one pair documenting in-hospital infection of an HIV+ woman by a patient on the same hospital floor. One large cluster of 18 cases was detected: 15 males, mostly HIV+, homeless and staying in a nearby facility for men (Shelter X); and three females, all HIV+, homeless, drug users. TABULAR DATA, SEE ABSTRACT VOLUME. CONCLUSIONS: A high rate of recent TB transmission was revealed by DNA FP in the absence of MDR TB or other outbreak signs. Although a local men's shelter appeared the primary focus, the involvement of three women and several men not known to be shelter residents plus the detection of at least one case of in-hospital transmission indicates the size and complexity of the problem. Widespread, or possibly routine DNA FP of TB isolates may be useful to detect sites and risks for transmission, particularly where high rates of TB and HIV coexist.

---

Mahon N; Jones M; McGovern T; Shapiro L; Shubert V; Elovich R; Robinson C; Isbell M; Jacobs S; Williams B. **The non-compliant health care system: developing a system for TB prevention and care in New York City.** Int Conf AIDS 9:123 (abstract no. WS-D20-6), 1993.

ISSUE: The burden of the recent resurgence of TB in New York City has fallen overwhelmingly on populations that have been tragically underserved by the city health care system, namely people of color, homeless people, addicts and alcoholics, prisoners and parolees, and others living in poverty. Members of these groups who are living with HIV/AIDS face a particularly serious threat in the worsening TB epidemic, yet the city has failed to provide them with an adequate protection or services. OBJECTIVES AND METHODS: Based on authors' advocacy experience, identify barriers to TB diagnosis and treatment for disenfranchised people living with HIV in New York City, and detail a TB control strategy that can protect all New Yorkers without the need to resort to inhumane institutionalization or illegal restrictions of liberty. RESULTS: The city's "system" for TB prevention and treatment is under-funded, difficult to access, and marked by gaps in services. Many HIV+ people living in poverty face unnecessary risk of TB infection in unsafe hospitals, shelters and prisons. Those with TB are routinely discharged from hospitals without follow-up appointments, medications, chemical dependency diagnosis and treatment referrals, housing placements or other adequate planning for ongoing care. Out-patient TB testing and treatment is limited, overburdened and unable to integrate TB treatment with patients' ongoing HIV medical care. Limited pharmacy hours and gaps in Medicaid coverage and other benefits severely hamper the ability of TB patients to obtain necessary medications. CONCLUSIONS: While compliance with necessary medical care is ultimately a matter of personal responsibility, TB patients will only be able to truly exercise such responsibility if they are enabled to meet more urgent needs, such as food and permanent housing. Consequently, unless adequate, accessible systems of care are in place to make voluntary treatment compliance possible, it is premature, fiscally unsound, and inhumane to detain people in the chronic, non-infectious stage of TB disease. The urgent need to successfully stem the tide of the TB epidemic demands the removal of systemic barriers to patient compliance not the wide-scale detention of individual patients who are denied access to medical care.

---

Pilote L; Peterson J; Zolopa A; Moss A. **Improving adherence to TB and HIV screening in the homeless.** Int Conf AIDS 9:510 (abstract no. PO-B32-2247), 1993.



Early intervention for persons infected with HIV and TB has clear benefit. Adherence to treatment regimens in both these infections is a major problem, especially for the homeless. To test two interventions aimed at improving compliance with TB screening and prophylaxis and accessing HIV-related care in the homeless, we conducted a randomized clinical trial of inner city homeless adults who were newly diagnosed HIV or purified protein derivative (PPD) positive. The outcome measured was completing a comprehensive evaluation at the TB clinic or the HIV clinic at the public hospital. Subjects were randomized to either: (1) Peer Health Advisor (PHA): assigned to a formerly homeless person who assisted them in getting to clinic; (2) Money incentive: paid to go to clinic; or (3) Usual care: given appointments and bus tickets to go to clinic. From June to December 1992, 91 subjects were enrolled, 29 to PHA, 31 to the money incentive and 31 to usual care. The median age was 38 years, 87% were men and 56% were African American. Nine were HIV positive, 81 PPD positive and one positive for both. Clinic evaluations were completed by 76% of the PHA subjects, 81% of paid subjects and 52% of those in usual care. Both interventions significantly improved adherence when compared to usual care. This suggests that even difficult high risk populations can be reached with interventions that address their particular access problems and needs.

---

Salomon P; Veiga R; Gray J; Tommer M; Holloway J; Gaston M. **HIV infection, AIDS endemicity and other risk factors for tuberculosis among the homeless.** Int Conf AIDS 9:736 (abstract no. PO-C21-3114), 1993.

**BACKGROUND:** In 1989, 109 centers receiving Stuart B. McKinney Act support for primary health care for homeless persons, increased their TB service activity by 200%. At this time 8.3% of program users were known to be HIV+. HIV infection, TB, and homelessness may be considered interdependent in the sense that the existence of any one of these conditions increases the likelihood of incurring the others. **OBJECTIVE:** To study the inter-relationship of HIV and TB, on the provision of primary care for homeless persons, based on program data submitted by Health Care for the Homeless (HCH) providers, during CY 1990. **METHOD:** In 1990, a small subset of HCH primary care grantees accounted for approximately 90% of the TB related services reported. Data provided by these grantees was analyzed to explore a possible relationship of increased TB service activity with extent of known HIV seropositivity and or AIDS among the homeless persons served, as well as AIDS case rates in the surrounding community. An analysis was also made of the relationship between the reported level of TB service activity for the homeless and local TB case rates. Grantees were further analyzed in relation to a variety of clinical and demographic factors that can contribute to increased prevalence of tuberculosis among the homeless. **RESULTS:** Information will be presented on co-location and co-occurrence of HIV and TB among the homeless, as well as the relationship of these conditions to substance abuse, temporary shelter conditions, and other factors.

## 1992

Imperato PJ. **Tuberculosis, AIDS, and homelessness.** Journal of Community Health 17(4): 187-9, 1992.

---

Selwyn PA; Sckell BM; Alcabes P; Friedland GH; Klein RS; Schoenbaum EE. **High risk of active tuberculosis in HIV-infected drug users with cutaneous anergy.** [published erratum appears in JAMA 268(24):3434, 1992] [see comments]. JAMA, 268:504-9, 1992.

**OBJECTIVES:** To determine the incidence of active TB in HIV-seropositive and HIV-seronegative drug injectors with cutaneous anergy and to examine the effectiveness of isoniazid chemoprophylaxis in preventing TB among drug injectors with positive tuberculin test results. **DESIGN AND SETTING:** Prospective observational study linked to an ongoing study of HIV infection within a New York City (NYC) methadone program; subjects also underwent routine intradermal tuberculin testing and multiple-antigen delayed-type hypersensitivity skin testing. The 31-month

study period ended December 31, 1990. METHODS: Anergic subjects and tuberculin reactors who were HIV seropositive were compared by HIV disease status and CD4+ T-lymphocyte levels. TB incidence was calculated for anergics (none treated with isoniazid) and for treated and untreated tuberculin reactors, by HIV serological status. RESULTS: Among those seropositive for HIV, anergic subjects had more advanced HIV disease and fewer CD4+ cells (median 0.33 vs 0.56 x 10<sup>9</sup>/L) compared with tuberculin reactors, although neither clinical status nor CD4+ cell counts consistently predicted anergy. Five (7.6%) of 68 anergic subjects who were HIV seropositive and none of 52 anergic subjects who were HIV seronegative (n=18) or of unknown (n=34) HIV serological status developed active TB during the study period. The TB incidence rate among anergic subjects who were HIV seropositive was 6.6 cases per 100 person-years. Of 25 HIV-seropositive tuberculin reactors who did not receive or complete 12 months of isoniazid prophylaxis, TB incidence was 9.7 cases per 100 person-years, compared with the rate among anergic HIV seropositives; there were no cases of TB in 53.4 person-years of follow-up for 27 HIV-seropositive tuberculin reactors who received 12 months of prophylaxis (rate difference between treated and untreated groups, 9.7 cases per 100 person-years. CONCLUSION: Drug injectors with cutaneous anergy who are seropositive for HIV are at high risk of active TB, similar to that among untreated HIV-seropositive tuberculin reactors. A decreased incidence of active TB was seen in HIV-seropositive tuberculin reactors receiving 12 months of isoniazid chemoprophylaxis, compared with untreated or partially treated subjects. These results support the routine use of delayed-type hypersensitivity testing to accompany tuberculin testing for drug injectors with known or suspected HIV infection, and consideration of isoniazid prophylaxis for anergic as well as tuberculin-reactive subjects who are HIV seropositive, in populations with a high prevalence of coexisting HIV and Mycobacterium TB infection.

---

Zolopa A; Vranizan K; Meakin R; Moss AR. **Tuberculosis (Tb) and HIV infection in the homeless population of San Francisco (SF), CA.** Int Conf AIDS, 8:Tu40 (abstract no. TuC 0571), July 19-24, 1992.

OBJECTIVE: To determine the prevalence and risk factors for HIV and Tb infection (PPD+) in homeless adults, and to investigate the relationship between these two infections in this high risk population. METHODS: This population-based cross-sectional study has enrolled 916 subjects from public shelters and free meal lines throughout SF. Since January 1991, 697 subjects have had a PPD skin test in addition to an interview and a serum HIV test. RESULTS: Tb and HIV are common infections in this population: 28% were PPD+ and 10% were HIV+. There is substantial overlap between these two infections, 20% of the HIV+'s are also PPD+. The actual degree of overlap may be much higher than this given the problem of HIV-induced anergy. Most subjects were unaware of either their TB infection (80%) or HIV infection (85%). Even fewer had received prior medical evaluation for these infections. The traditional risk factors of intravenous drug use (IVDU) and male homosexual contact accounted for a majority of the HIV infection in this population: 88% in males and 75% in females. Homeless IVDU gay men were at particular high risk, 70% were HIV+. Even in the "low risk" homeless (i.e., non-IVDU heterosexuals), the HIV rate was relatively high at 2-3%. The HIV prevalence rates by race were unexpected: whites 11%, blacks 9%, Hispanics 9%. This racial pattern was reversed for PPD+: whites 16%, blacks 35%, Hispanics 48%. Time homeless did not distinguish HIV status but did predict PPD status: median time homeless was 12 months in both HIV+ & HIV-, whereas, PPD+'s had a median time homeless of 16 months compared to eight months for the PPD-'S. Persons living in public shelters had over twice the rate of PPD+ compared to persons living "on the streets" (32% vs. 14%). Psychiatric conditions, crack cocaine use and alcoholism, although common features of this population, did not appear to be risk factors for either HIV or TB infection. CONCLUSIONS: The homeless population of SF has relatively high rates of HIV and TB infection with many persons doubly infected. Given the combination of poverty, crowded living conditions, high risk behaviors and lack of medical services, this population is likely to suffer increasingly from these communicable diseases in the 1990's. These data call for a comprehensive approach which addresses all of these features of homelessness. Piecemeal programs, for example providing public shelters without adequate medical services, may in fact worsen the problem of communicable disease's in this population.

Brudney K; Dobkin J. **Resurgent tuberculosis in New York City. Human immunodeficiency virus, homelessness, and the decline of tuberculosis control programs.** Am Rev Respir Dis 144:745-9, 1991.

The resurgence of tuberculosis in New York City has been largely attributed to the acquired immune deficiency syndrome (AIDS) epidemic. However, historical events predating the advent of AIDS and worsening economic and social conditions, including a rise in homelessness, have contributed significantly to the increase. We prospectively studied 224 consecutive patients with tuberculosis admitted to a large public hospital in New York over the first nine months of 1988. Initial assessment included medical status, human immunodeficiency virus (HIV) risk factors, and detailed social information, including substance abuse history and housing status. All patients were tracked after discharge to determine compliance and cure rates. Tuberculosis patients were predominantly male (79%), with high rates of alcohol use (53%), intravenous drug and/or "crack" cocaine use (64%), and homelessness or unstable housing (68%). Half the patients had AIDS or AIDS-related complex (ARC) or were HIV antibody positive. A total of 178 patients were discharged on tuberculosis treatment, but 89% of these were lost to follow-up and failed to complete therapy. Of the 178 discharged patients, 48(27%) were readmitted within 12 months with confirmed active tuberculosis. Of these patients, 40 were discharged on treatment and at least 35 were again lost to follow-up. In a multivariate regression model noncompliance was significantly associated with the absence of AIDS or ARC, homelessness, and alcoholism. Because HIV infection and tuberculosis converge in a subpopulation with high rates of substance abuse and homelessness, the problem of ensuring treatment compliance may grow considerably in the future.(ABSTRACT TRUNCATED AT 250 WORDS)

DePalo VA; Salomon N; Kolokathis A; Perlman DC; Pumerantz A; Raucher B. **A rise in drug-resistant mycobacterium tuberculosis (Mtb) in patients with HIV infection, substance abuse, and homelessness.** Int Conf AIDS 7:225 (abstract no. M.B.2174), 1991.

OBJECTIVE: To describe the characteristics of patients with drug-resistant Mtb. METHODS: We retrospectively reviewed mycobacteriology logbooks and patient medical records from 1986 to 1990 for cases of Mtb. Isolates were tested for sensitivity to 0.2 and 1.0 ug/ml isoniazid (INH), 1.0 and 2.0 ug/ml rifampin (RIF), 2.0 and 10.0 ug/ml streptomycin, and 5.0 to 10.0 ug/ml ethambutol by a radiometric system (Bactec, Johnston Laboratories, Towson, Maryland). RESULTS: We identified 33 cases of drug-resistant Mtb among 387 cases of Mtb (9%). Resistance rates increased significantly by year: 0% (0/25) in 1986; 0% (0/87) in 1987; 6% (5/80) in 1988; 8% (6/76) in 1989; and 18% (22/119) in 1990. Among the 33 cases of drug-resistant Mtb, 33% were primary resistance, and 67% were secondary resistance; 67% were resistant to INH alone, 27% to INH and RIF, and 6% to more than two drugs. Site of infection was primarily lung (94%). Mean age was 38.3 years. Male-female ratio 3:1. Race distribution was: 48% black, 33% Hispanic, 15% white, 3% Asian. An HIV risk was present in 72%. HIV status was known in 76%; among these 88% were HIV positive. Substance abuse was present in 58%: alcohol (51%), IV heroin or cocaine (45%), crack (6%). Homelessness was present in 42% of cases. CONCLUSIONS: We report a significant increase in drug-resistant Mtb. We also report an increase in the rate of primary drug resistance. Drug-resistant Mtb and primary drug resistance appear to occur in the setting of HIV infection, substance abuse, and homelessness.

Lin RY; Goodhart PT. **Population characteristics of tuberculosis in an HIV/AIDS registry from an East Harlem Hospital** [see comments] N Y State J Med, 91:239-42, June 1991.

The recent increase of tuberculosis nationally and in New York City has been attributed in part to the progression of the acquired immunodeficiency syndrome (AIDS)/human immunodeficiency syndrome (HIV) epidemic. The East

Harlem/South Bronx/Bushwick sections of New York City have an especially high incidence of tuberculosis. An HIV/AIDS registry (1986-1990) consisting of 1,312 patients from a community hospital serving East Harlem was examined for population characteristics associated with documented tuberculosis in the registrants. Tuberculosis affected males more commonly than females and was observed in comparable frequency in patients with AIDS-related complex (ARC) (12.9%) and AIDS (15.0%). The proportion of cases in blacks (18.3%) was significantly greater than that in Hispanics (10.4%) or whites (8.7%). Among intravenous (IV) drug users, the proportion of tuberculosis cases was also significantly higher in blacks than in Hispanics. These data could be consistent with a difference in exposure to tuberculosis and/or the purported racial susceptibility of blacks to tuberculosis infection. A review of new tuberculosis cases in East Harlem also suggests that blacks are at a greater risk for developing tuberculosis than Hispanics.

## 1990

Torres RA; Mani S; Altholz J; Brickner PW. **Human immunodeficiency virus infection among homeless men in a New York City shelter. Association with Mycobacterium tuberculosis infection.** Arch Intern Med 150:2030-6, 1990.

The HIV seroprevalence among a selected sample of 169 high-risk homeless men residing in a congregate shelter in New York City, NY, was 62%. Seropositivity for HIV correlated significantly with intravenous drug use and active TB. Most cases of active TBs were among homeless men with AIDS or AIDS-related complex; and significant CD4 lymphocyte depletion was associated with active TB. Total time homeless correlated positively with active and latent TB infection. Compliance rates with return for HIV antibody test results, medications, and follow-up visits were 70%, suggesting a significant degree of knowledge, awareness, and personal concern regarding HIV infection among homeless men; yet 28% of homeless intravenous drug users continue active drug injection, despite HIV infection. Cohabitation in overcrowded congregate dormitories creates a risk of airborne transmission of TB, which is a common reactivation infection in HIV-seropositive homeless men. Medically appropriate housing should be provided to such homeless persons, and expanded HIV antibody testing, counseling, and medical services on site should be offered to residents of shelters.